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No. XII.

ILLUMINATOR FOR A MARINE SEXTANT.

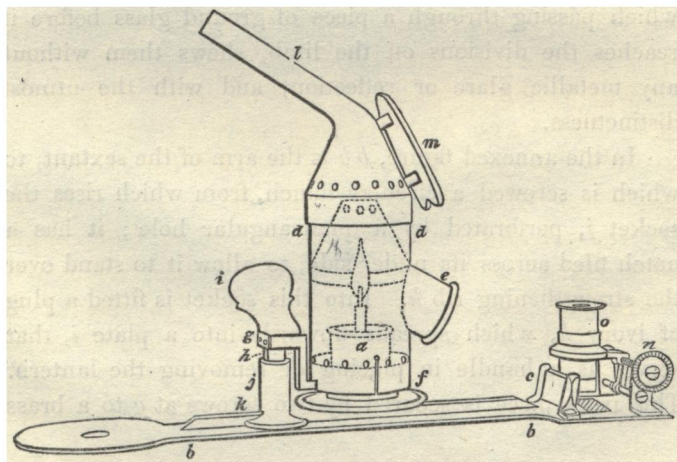
The LARGE SILVER MEDAL was presented to Mr. J. GRAY, 4 Upper East Smithfield, for his Illuminator for a Marine Sextant, one of which has been placed in the Society's Repository.

AFTER making a night observation at sea, the result is read off by holding a lantern with or without a reflector, so as to throw light on the part of the limb under the microscope; but unless the lantern is held accurately over a radial line drawn from the centre of the instrument to the divisions under examination, such divisions, from the effect of shadow, will appear a little on one side of their true place.

To remedy this cause of error, Mr. Gray has a small lantern, capable of being at once fixed in its true position on the movable arm of the sextant, the light from which passing through a piece of ground glass before it reaches the divisions on the limb, shews them without any metallic glare or reflection, and with the utmost distinctness.

In the annexed figure, *bb* is the arm of the sextant, to which is screwed a circular flanch, from which rises the socket *j*, perforated by a quadrangular hole; it has a notch filed across its under side, to allow it to stand over the strengthening rib *k*. Into this socket is fitted a plug of ivory *h*, which spreads upwards into a plate *i*, that serves as a handle in placing or removing the lantern. This ivory piece is secured by two screws at *g* to a brass

arm, which rises from the bottom of the lantern, and supports it at a little distance above the arm of the sextant, that this latter may not be expanded by the heat of the lantern; for further security, and to intercept any radiation, a disk of ivory *f* is fixed to the bottom of the lantern; *a* is the lamp; *dd* a copper tube forming the body of the lantern, within which is a cone, shewn by dotted lines, to prevent the light from being blown about by the wind. In the bottom of the tube *dd* are three slits, to make it spring, and thus allow of its being put on and taken off with great facility; *l* is an oblique funnel, for the purpose of conveying away the hot air and smoke, without annoying the observer; for which purpose, also, the ivory shield *m* is placed in front; *e* is a metal tube, on the outer end of which is screwed a round plate of clear glass. The light of the lamp passing through the tube and plate of glass, falls upon *c*, a slip of ground glass, which intercepts all glare, and throws a perfectly uniform soft light on the divisions of the limb; *o* is a microscope, capable of lateral motion, by turning the milled head *n*, by means of which the observation is read off.



Thus three important points are accomplished : the light is thrown in the best direction and manner on the divisions ; all other light is excluded ; and the heat of the lamp is prevented from expanding the sextant to which it is attached only for the time required to make an observation, which rarely exceeds one minute.

No. XIII.

APPARATUS FOR MAKING SHIP'S BISCUITS.

The LARGE GOLD MEDAL was voted to THOMAS TASSELL GRANT, Esq., of Weovil, near Portsmouth, for his improved Apparatus for the Manufacture of Ship's Biscuits.

THE advantages claimed for the new over the old method of preparing ship's biscuit are, superior economy and expedition, greater cleanliness in the process, and a better quality in the manufactured article.

The mode of making ship's biscuit, as practised in the King's bakehouse at Portsmouth, was as follows:—

Five men were appointed to the service of each of the nine ovens, being forty-five in the whole.

The first of these was the idlerman, whose business was to mix the meal and water in due proportions, and to incorporate the materials as accurately as possible by kneading the dough for half an hour, with his naked arms plunged into it up to the elbows, and finishing the operation by jumping into the trough and treading the dough with his feet. Hence it passed to the brakeman, who